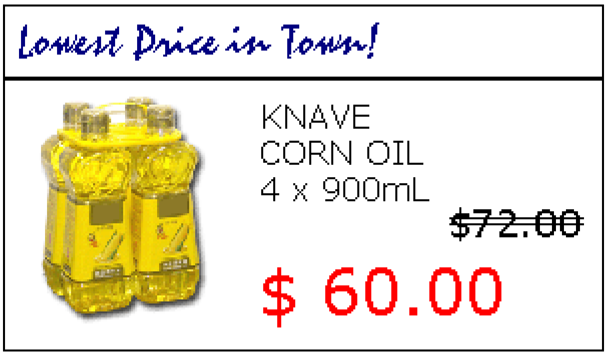
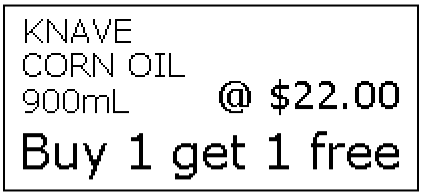
It is sometimes tricky to figure out the *cheapest* way to buy things, even in the supermarket where the price of all goods are listed clearly. Just consider what I saw last Saturday about the price of cooking oil: (notice the difference in the sizes of the two price tags)





Having a sharp mind (a consequence of regularly taking part in online programming contests), you should have no problem in seeing that the 'buy-1-get-1-free' scheme is preferable. But what about your Mum? It is your responsibility as her son/daughter to **write her a program** that computes the lowest price to buy things in the supermarket, thus helps her to save money.

Input

The input consists of more than a hundred test cases, each concerning a different item. The first line of each case gives the unit price of buying an item, then a non-negative integer M (≤ 20). This is followed by M lines each containing two numbers N and P ($1 < N \leq 100$), which means that you can buy N such items for $\$P$. Finally there is a line containing a list of positive integers K (≤ 100).

Output

For each of them your program should print the lowest price you need to get K items. Note that you do **not** have to buy *exactly* K items; you may consider buying more than K items, and giving the unneeded items to your dear neighbours, if you can save money in this way.

Note that all prices P given in the input are floating-point numbers in exactly 2 decimal places, with $0 < P < 1000$.

Sample Input

```
22.00 2
2 22.00
4 60.00
2 4
25.00 2
2 48.00
2 46.00
2
22.00 2
2 22.00
4 40.00
1 2 3
```

Sample Output

```
Case 1:
Buy 2 for $22.00
Buy 4 for $44.00
Case 2:
Buy 2 for $46.00
Case 3:
Buy 1 for $22.00
Buy 2 for $22.00
Buy 3 for $40.00
```